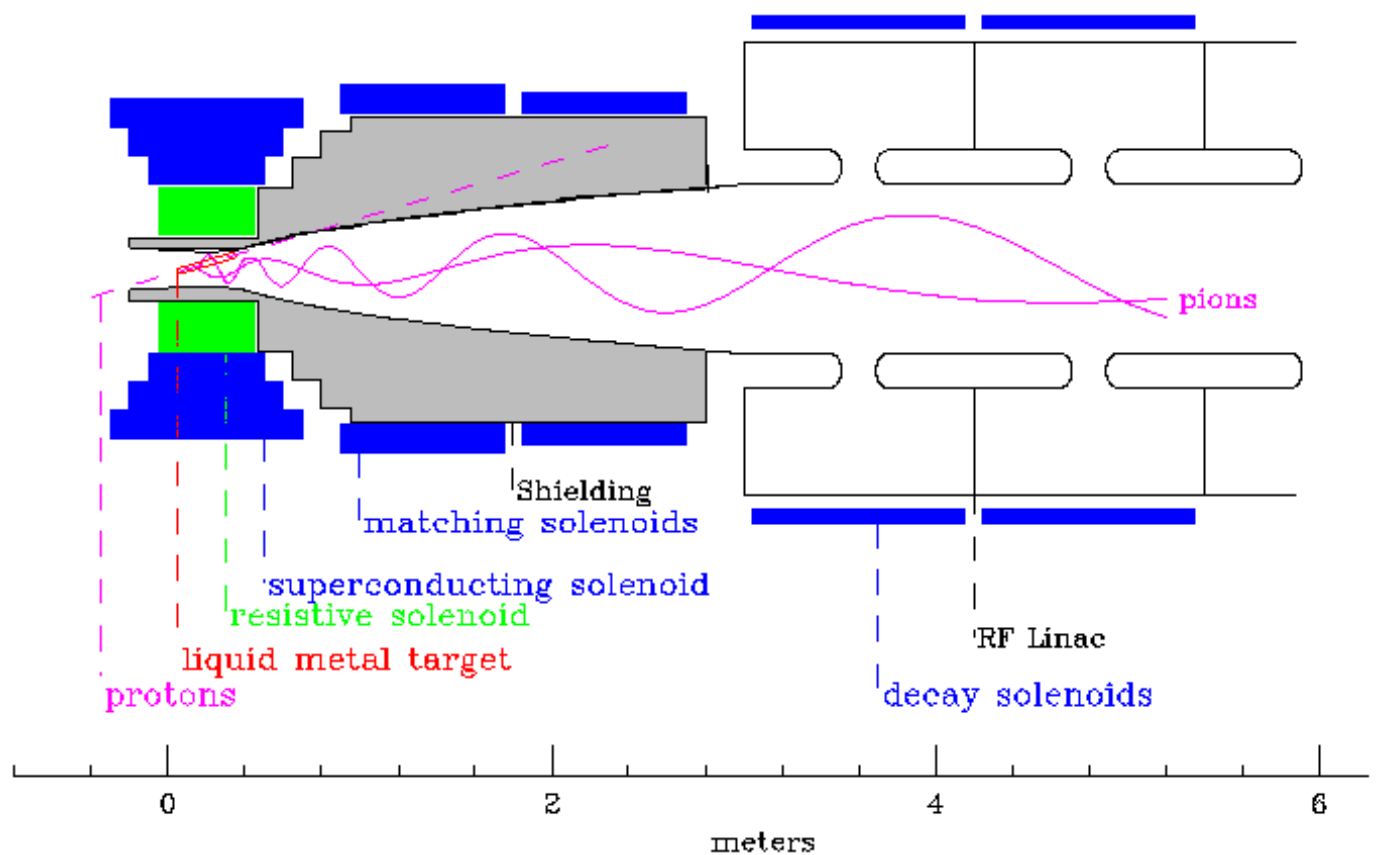
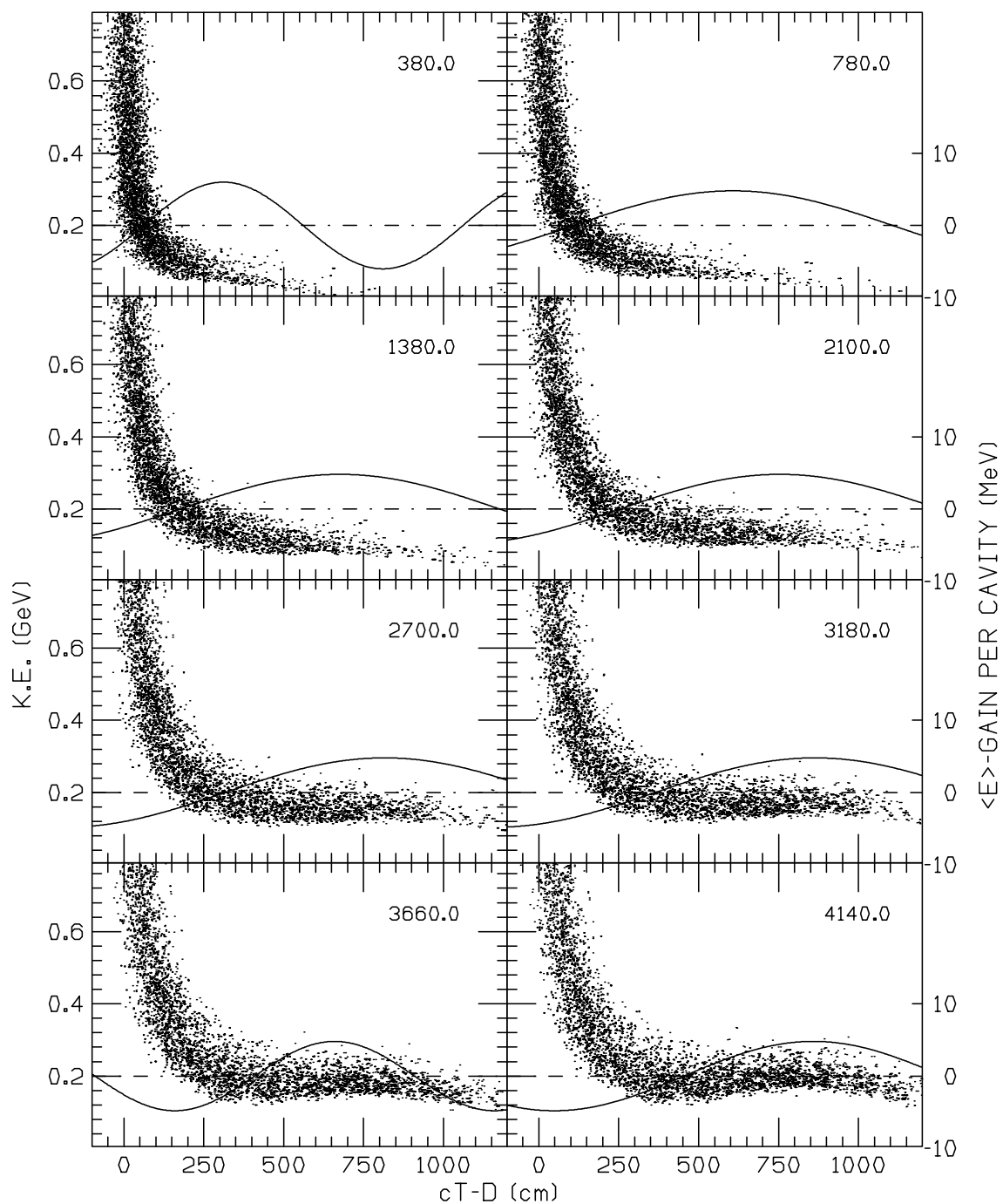


TARGET, CAPTURE & DECAY



- TARGET: Liquid Metal Jet
- CAPTURE: 20 T Solenoid
- BEAM DUMP
- MATCHING
- DECAY & PHASE ROT: 1.25 T



09:44:45 17-JUN-99 qaVSPL.0mrad

Summary of Low Frequency Cavities

Gradients used in various models

	Parmela Kirk	MCMuon Palmer	ICOOOL Fukui	MCMuon Palmer
Freq MHz	$\langle E \rangle$ MV/m			
100	4.5			
90	4.2		4	
60	3.6	5		8
50	3.3		5	
45	3.3			7
30	2.1	4	4	5

Phase Rotation #1

	len m	rad	B T	f MHz	grad MV/m	n/n	σ_{ct} m	dE/E %	emit π mm
target	.45	.075	20			.66	.3	100	-
match	3	.2	2						
rf	3	.3	1.25	60	8				
rf	33	.3	1.25	30	5				
rf	7.5	.3	1.25	45	7	.35	1.8	15	20

Mini Cooling

	len m	rad	B T	f MHz	grad MV/m	n/n	σ_{ct} m	dE/E %	emit π mm
cool 1	3.5	.3	1.25			.33	1.8	15	11

Options:

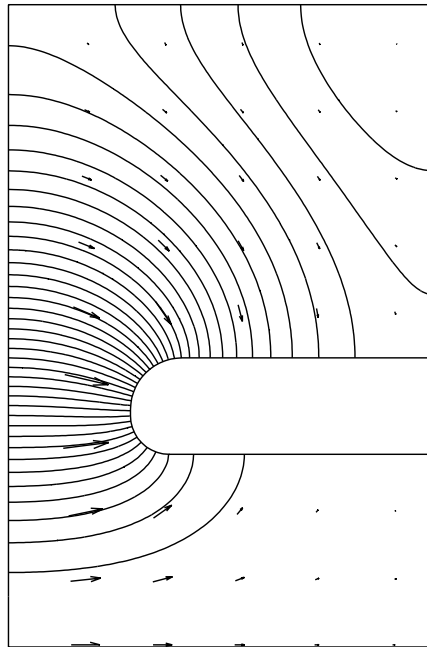
Increase final energy to increase minicooling and other possible advantages.

Decrease gradients (for technical reasons) resulting in lower final frequencies or lower efficiency.

Increase gradients (if possible) resulting in higher final frequencies or higher efficiency. Maybe better polarization.

Less minicooling, or a higher initial energy would reduce losses, but increase the needed length of drift in the second phase rotation.

Generic 70 MHz rf Cavity



Characteristics

- Frequency 70 MHz
- $R = 100$ cm
- $L = 132$ cm
- gap = 38 cm
- $Q = 48$ k
- $Z/L = 7.9$ M Ω /m

Generic 70 MHz rf Cavity

If $\langle E \rangle = 8 \text{ MV/m}$ then

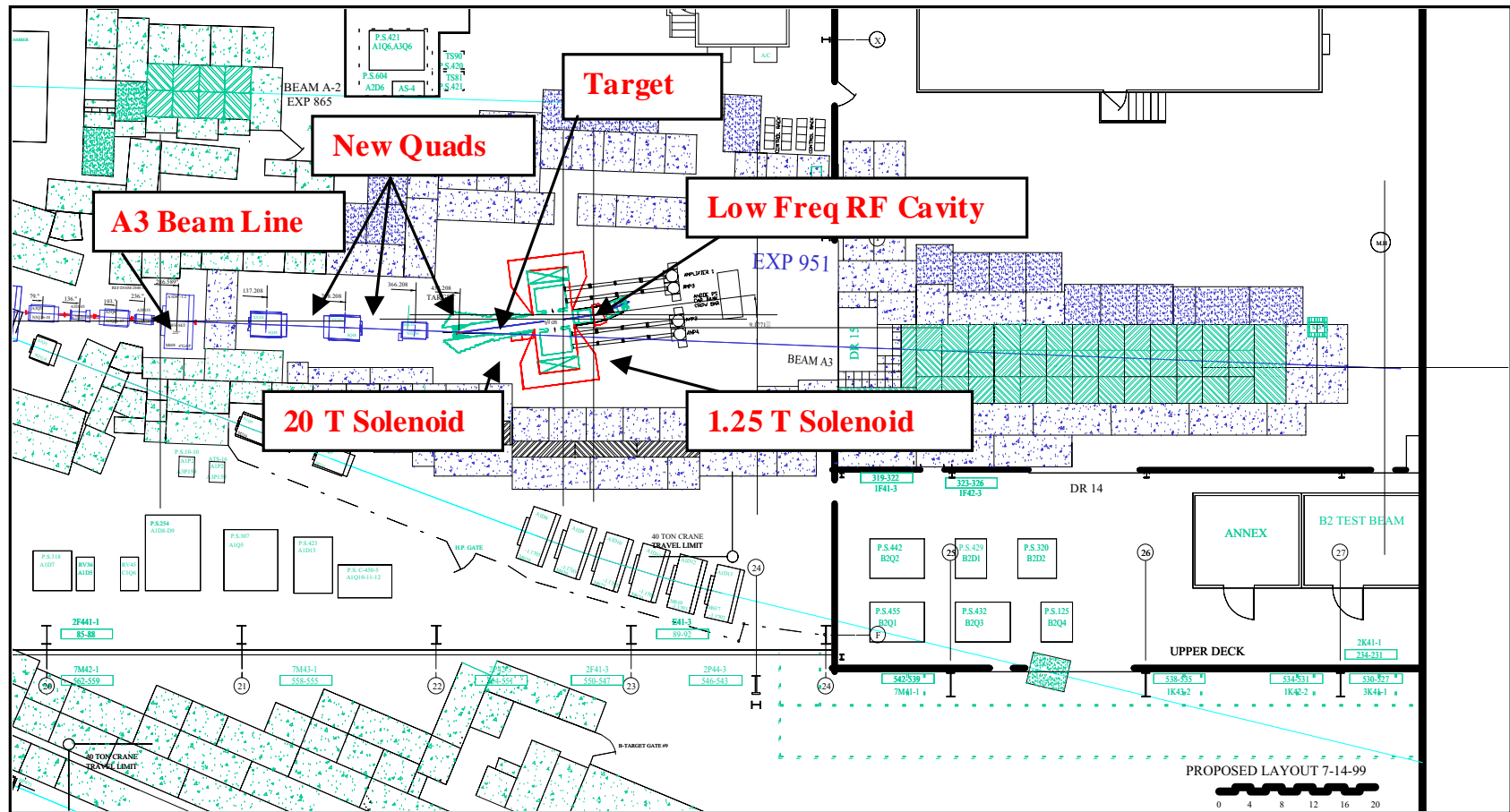
- $\langle \text{Power} \rangle = 10 \text{ MW} \rightarrow 8 \text{ MW/m}$
- $E_{max} = 42 \text{ MV/m}$

If $\langle \text{Power} \rangle = 4 \text{ MW/m}$ then

- $\langle E \rangle = 5.7 \text{ MV/m}$
- $E_{max} = 30 \text{ MV/m}$

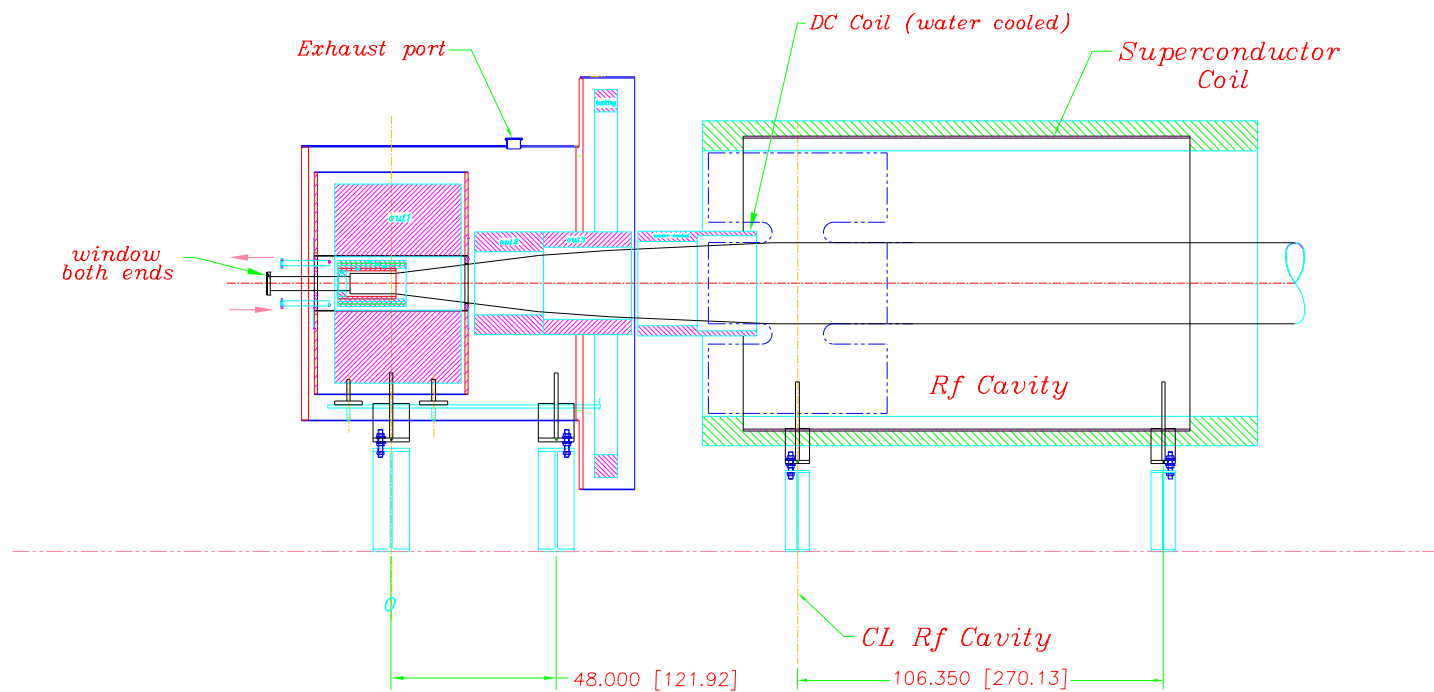
Key 70 MHz rf r&d Issues

- What is the maximum achievable $\langle E \rangle$?
 - Can we produce the high-peak rf power necessary to obtain high $\langle E \rangle$?
 - Is $E_{max} = 30$ MV/m achievable?
- Can high gradients be maintained in a high-radiation environment?



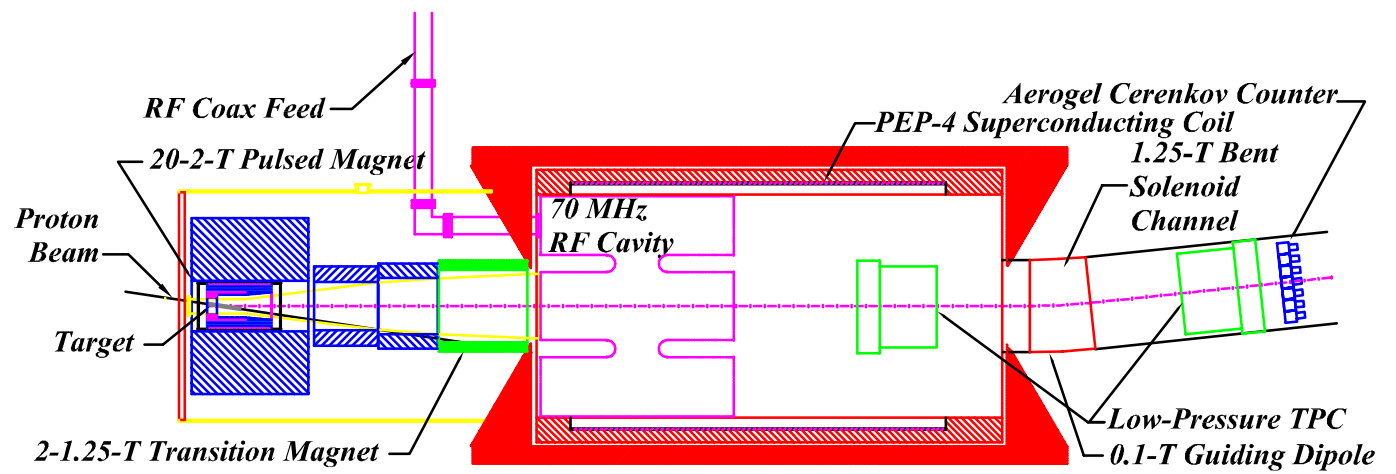
Experiment 951: An R&D Program for Targetry and Capture at a Muon-Collider

Experimental Layout with pulsed bucking coil



Version 5a
07/15/99

Experimental Layout with iron



Targetry Experiment in the A3 Line

